

* For Examiner Reference *

I CLAIM:

1. A supercharged internal combustion engine, comprising:

a common exhaust manifold (12) and a common
5 combustion air manifold (13) for all combustion chambers of cylinders of
said internal combustion engine;

a plurality of exhaust-driven superchargers (14, 15, 16) that
are staggered as a function of the output of said internal combustion
engine, wherein each of said superchargers has an exhaust-driven
10 turbine (17) via which said supercharger is engageable or disengageable
with said exhaust manifold (12) and wherein each of said superchargers
has a compressor (28);

a charging fan (31) wherein said charging fan is disposed
upstream of and in series with the compressor (28) of one of said
15 superchargers (14, 15, 16), wherein each of said superchargers, at an
input side of its compressor (28), has a line connection, via a respective
valve mechanism (26, 27), to an output of said charging fan (31), and
wherein all of said valve mechanisms, for an oppositely directed
changeover between supply air compressed by said charging fan (31)
20 and ambient air, are adjusted as a function of a speed of an associated
supercharger (14, 15, 16) and a combustion air operating pressure;

a separate motor (34) for driving said charging fan (31), and

a processing means (19) having a stored requirements profile for the sole release of the valve mechanism (26, 27) of a given one of said superchargers (14, 15, 16) that is to be engaged in a staggered operation.

5 2. An internal combustion engine according to claim 1, wherein during acceleration of said engine, operation of said charging fan (31) is limited by said processing means (19) to a starting range of a respective one of said superchargers (14, 15, 16) in a switching sequence of all staggered and activated superchargers.

10 3. An internal combustion engine according to claim 2, wherein during slowing-down of said engine, operation of said charging fan (31) is limited by said processing means (19) to a range, corresponding to the starting range, of the pertaining supercharger (14, 15, 16) in the switching sequence of all staggered and activated
15 superchargers.

 4. An internal combustion engine according to claim 1, wherein a respective exhaust gas valve (18), which is controllable by said processing means (19) is associated with each of said superchargers (14, 15, 16) for individual placement into operation
20 thereof, and wherein said exhaust gas valve (18), as well as said valve mechanism (26, 27), is embodied as a proportional valve.

5. An internal combustion engine according to claim 1, wherein for a uniform staggering of an operating range of said engine, six to ten identical superchargers (14, 15, 16) are provided.

5 6. An internal combustion engine according to claim 1, wherein said separate motor (31) for driving said charging fan (31) draws drive energy from an electrical vehicle battery (35).

7. An internal combustion engine according to claim 1, which is embodied as a Diesel engine having a compression that is greatly reduced to about 8:1.

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